```
d his

     (FILE 'USPAT' ENTERED AT 14:01:29 ON 30 SEP 92)
L1             9 S CAPSULAR POLYMER#
L2          1112 S REDUCTIVE AMINATION
L3         11560 S IMMUNOGEN? OR ANTIGEN?
L4          1182 S BACTERIAL AND (TOXIN# OR TOXOID#)
L5            19 S L4 AND L3 AND L2
L6             6 S L5 AND L1

=>
```

APS
07/819305

File APS
07/819305

```
=> capsular polymer#
            909 CAPSULAR
         168344 POLYMER#
L1            9 CAPSULAR POLYMER#
                (CAPSULAR(W)POLYMER#)

=> d 1-9
```

1. 5,097,020, Mar. 17, 1992, Immunogenic conjugates; Porter W. Anderson, et al., 530/403; 424/88, 89, 92; 435/68.1; 530/395, 402, 404, 405, 406, 807 [IMAGE AVAILABLE]

2. 5,077,320, Dec. 31, 1991, Microvoid-containing polymer particles; Hideki Touda, et al., 521/65 [IMAGE AVAILABLE]

3. 4,972,000, Nov. 20, 1990, Hollow polymer particles, process for production thereof, and use thereof as pigment; Nobuo Kawashima, et al., 521/54; 427/222; 428/407; 521/55, 57, 134; 525/902 [IMAGE AVAILABLE]

4. 4,902,506, Feb. 20, 1990, Immunogenic conjugates; Porter W. Anderson, et al., 424/92, 88; 530/350

5. 4,883,757, Nov. 28, 1989, Bioemulsifier production by Acinetobacter calcoaceticus strains; David L. Gutnick, et al., 435/252.1; 252/351; 435/253.6, 822 [IMAGE AVAILABLE]

6. 4,808,700, Feb. 28, 1989, Immunogenic conjugates of non-toxic E. coli LT-B enterotoxin subunit and **capsular** **polymers**; Porter W. Anderson, et al., 424/92; 435/6, 172.3, 240.27; 514/12; 530/403, 807, 808, 812; 935/12

7. 4,762,713, Aug. 9, 1988, Boosting of immunogenic conjugate vaccinations by unconjugated bacterial **capsular** **polymers**; Porter W. Anderson, 424/92, 88

8. 4,761,283, Aug. 2, 1988, Immunogenic conjugates; Porter W. Anderson, 424/92, 88; 530/350

9. 4,673,574, Jun. 16, 1987, Immunogenic conjugates; Porter W. Anderson, 424/92; 530/350

```
=> s pedlyeaave amination
          6226 REDUCTIVE
          2943 AMINATION
L2        1112 REDUCTIVE AMINATION
                 (REDUCTIVE(W)AMINATION)

=> s immunogen? or antigen?
          2626 IMMUNOGEN?
         11137 ANTIGEN?
L3       11560 IMMUNOGEN? OR ANTIGEN?

=> s bacterial and (toxin# or toxoid#)
         20699 BACTERIAL
          2761 TOXIN#
           474 TOXOID#
L4        1182 BACTERIAL AND (TOXIN# OR TOXOID#)

=> s l4 and l3 and l2
L5          19 L4 AND L3 AND L2

=> s l5 and l1
L6           6 L5 AND L1

=> d 1-6
```

1. 5,097,020, Mar. 17, 1992, **Immunogenic** conjugates; Porter W. Anderson, et al., 530/403; 424/88, 89, 92; 435/68.1; 530/395, 402, 404, 405, 406, 807 [IMAGE AVAILABLE]

2. 4,902,506, Feb. 20, 1990, **Immunogenic** conjugates; Porter W. Anderson, et al., 424/92, 88; 530/350

3. 4,808,700, Feb. 28, 1989, **Immunogenic** conjugates of non-toxic E. coli LT-B enterotoxin subunit and **capsular** **polymers**; Porter W. Anderson, et al., 424/92; 435/6, 172.3, 240.27; 514/12; 530/403, 807, 808, 812; 935/12

4. 4,762,713, Aug. 9, 1988, Boosting of **immunogenic** conjugate vaccinations by unconjugated **bacterial** **capsular** **polymers**; Porter W. Anderson, 424/92, 88

5. 4,761,283, Aug. 2, 1988, **Immunogenic** conjugates; Porter W. Anderson, 424/92, 88; 530/350

6. 4,673,574, Jun. 16, 1987, **Immunogenic** conjugates; Porter W. Anderson, 424/92; 530/350

=> d bib

US PAT NO: 5,097,020 [IMAGE AVAILABLE] L6: 1 of 6
DATE ISSUED: Mar. 17, 1992
TITLE: **Immunogenic** conjugates
INVENTOR: Porter W. Anderson, Rochester, NY
Ronald J. Eby, Rochester, NY
ASSIGNEE: The University of Rochester, Rochester, NY (U.S. corp.)
APPL-NO: 07/423,081
DATE FILED: Oct. 18, 1989
ART-UNIT: 183
PRIM-EXMR: Christine Nucker
ASST-EXMR: Kay K. Kim
LEGAL-REP: Pennie & Edmonds

=> d clms

US PAT NO: 5,097,020 [IMAGE AVAILABLE] L6: 1 of 6

CLAIMS:

CLMS(1)

We claim:

1. An **immunogenic** conjugate, comprising: the **reductive** **amination** product of a **capsular** **polymer** fragment having at least two carbonyl groups and derived from the **capsular** **polymer** of a **bacterial** pathogen by a process which comprises first treating said polymer with acid, base or enzyme and then generating carbonyl groups by treatment with an oxidizing agent, and a **bacterial** **toxin** or **toxoid**, said conjugate comprising a cross-linked conjugate in which there is a direct covalent linkage between the **capsular** **polymer** fragment and the **toxin** or **toxoid**.

CLMS(2)

2. The **immunogenic** conjugate of claim 1, wherein the **capsular** **polymer** is **immunogenic** in mature humans and less **immunogenic** in infant humans.

CLMS(3)

3. The **immunogenic** conjugate of claim 1, wherein the **reductive** **amination** is performed in the presence of cyanoborohydride anions.

CLMS(4)

4. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is diphtheria **toxin** or **toxoid**.

CLMS(5)

5. The **immunogenic** conjugate of claim 4, wherein the **toxoid** is CRM.sub.197.

CLMS(6)

6. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(7)

7. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a pseudomonas **toxin** or **toxoid**.

CLMS(8)

8. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a staphylococcus **toxin** or **toxoid**.

CLMS(9)

9. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a streptococcus **toxin** or **toxoid**.

CLMS(10)

10. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is pertussis **toxin** or **toxoid**.

CLMS(11)

11. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is an Escherichia coli **toxin** or **toxoid**.

CLMS(12)

12. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Haemophilus influenzae type b.

CLMS(13)

13. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Escherichia coli.

CLMS(14)

14. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis.

CLMS(15)

15. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis serogroup A.

CLMS(16)

16. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis serogroup C.

CLMS(17)

17. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae.

CLMS(18)

18. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(19)

19. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 12.

CLMS(20)

20. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(21)

21. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(22)

22. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(23)

23. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 51.

CLMS(24)

24. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Haemophilis influenzae type b.

CLMS(25)

25. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(26)

26. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(27)

27. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(28)

28. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(29)

29. The **immunogenic** conjugate of claim 1, wherein the fragment is

derived from the **capsular** **polymer** by oxidative cleavage.

CLMS(30)

30. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by periodate.

CLMS(31)

31. An **immunogenic** conjugate comprising: a formalin treated **reductive** **amination** product of a **capsular** **polymer** fragment having at least two (2) carbonyl groups and derived from the **capsular** **polymer** of a **bacterial** pathogen by a process which comprises first treating said polymer with acid, base or enzyme and then generating carbonyl groups by treatment with an oxidizing agent, and a **bacterial** **toxin** or **toxoid**, said conjugate comprising a cross-linked conjugate in which there is a direct covalent linkage between the **capsular** **polymer** fragment and the **toxin** or **toxoid**.

CLMS(32)

32. The **immunogenic** conjugate of claim 31 wherein the **bacterial** **toxoid** is diphtheria **toxoid**.

CLMS(33)

33. The **immunogenic** conjugate of claim 31 wherein the **toxoid** is CRM.sub.197.

CLMS(34)

34. The **immunogenic** conjugate of claim 31 wherein the **bacterial** **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(35)

35. A method for preparing an **immunogenic** conjugate, comprising forming the **reductive** **amination** product of a **capsular** **polymer** fragment having at least two carbonyl groups and derived from the **capsular** **polymer** of a **bacterial** pathogen by a process which comprises first treating said polymer with acid, base or enzyme and then generating carbonyl groups by treatment with an oxidizing agent, and a **bacterial** **toxin** or **toxoid**, said **reductive** **amination** being performed in the presence of cyanborohydride ions, said conjugate comprising a cross-linked conjugate in which there is a direct covalent linkage between the **capsular** **polymer** fragment and the **toxin** or **toxoid**.

CLMS(36)

36. The method of claim 35, wherein the **capsular** **polymer** is **immunogenic** in mature humans and less **immunogenic** in infant humans.

CLMS(37)

37. The method of claim 35, wherein the **toxin** or **toxoid** is diphtheria **toxin** or **toxoid**.

CLMS(38)

38. The method of claim 35, wherein the **toxin** or **toxoid** is CRM.sub.197.

CLMS(39)

39. The method of claim 35, wherein the **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(40)

40. The method of claim 35, wherein the **toxin** or **toxoid** is pseudomonas **toxin** or **toxoid**.

CLMS(41)

41. The method of claim 35, wherein the **toxin** or **toxoid** is staphylococcus **toxin** or **toxoid**.

CLMS(42)

42. The method of claim 35, wherein the **toxin** or **toxoid** is streptococcus **toxin** or **toxoid**.

CLMS(43)

43. The method of claim 35, wherein the **toxin** or **toxoid** is pertussis **toxin** or **toxoid**.

CLMS(44)

44. The method of claim 35, wherein the **toxin** or **toxoid** is an Escherichia coli **toxin** or **toxoid**.

CLMS(45)

45. The method of claim 35, wherein the pathogen is Haemophilus influenzae type b.

CLMS(46)

46. The method of claim 35, wherein the pathogen is Escherichia coli.

CLMS(47)

47. The method of claim 35, wherein the pathogen is Neisseria meningitidis.

CLMS(48)

48. The method of claim 35, wherein the pathogen is Streptococcus pneumoniae.

CLMS(49)

49. The method of claim 35, wherein the pathogen is Pseudomonas.

CLMS(50)

50. The method of claim 37, wherein the pathogen is Haemophilus influenzae b.

CLMS(51)

51. The method of claim 37, wherein the pathogen is Streptococcus pneumonia.

CLMS(52)

52. The method of claim 35, wherein the fragment is derived from the **capsular** **polymer** by oxidative cleavage.

CLMS(53)

53. A method for preparing an **immunogenic** conjugate, comprising: forming the **reductive** **amination** product of a **capsular** **polymer** fragment having at least two carbonyl groups and derived from the **capsular** **polymer** of a **bacterial** pathogen, and a **bacterial** **toxin** or **toxoid**, said **reductive** **amination** being performed in the presence of cyanoborohydride ions, wherein the fragment is derived from the **capsular** polymer by periodate said conjugate comprising a cross-linked conjugate.

CLMS(54)

54. A method for preparing an immunogenic conjugate comprising: forming the reductive amination product of a capsular polymer fragment having at least two carbonyl groups and derived from the capsular polymer of a bacterial pathogen, and a bacterial toxin or toxoid, said reductive amination being performed in the presence of cyanohorohydride ions, in which the fragment is produced from the capsular polymer by first treating said polymer with acid, base or enzyme and then generating carbonyl groups by treatment with an oxidizing agent, said conjugate comprising a crosslinked conjugate.

CLMS(55)

55. The method of claim 54, further comprising treating said reductive amination product with formalin.

CLMS(56)

56. The method of claim 55, wherein the bacterial toxoid is diphtheria toxoid.

CLMS(57)

57. The method of claim 55, wherein the toxoid is CRM.sub.197.

CLMS(58)

58. The method of claim 55, wherein the bacterial toxin or toxoid is tetanus toxin or toxoid.

=> d clms 2-6

US PAT NO: 4,902,506 L6: 2 of 6

CLAIMS:

CLMS(1)

We claim:

1. An **immunogenic** conjugate comprising the **reductive** **amination** product of a **capsular** **polymer** fragment having a chain length of from about 10 to about 30 monomeric units and at least two carbonyl groups, which fragment is derived from the **capsular** **polymer** of a Streptococcus pneumoniae or Haemophilus influenzae bacterium, and a **bacterial** **toxin** or **toxoid**, said conjugate comprising a crosslinked conjugate.

CLMS(2)

2. The **immunogenic** conjugate of claim 1, wherein the **capsular** **polymer** is **immunogenic** in mature humans and less **immunogenic** in infant humans.

CLMS(3)

3. The **immunogenic** conjugate of claim 1, wherein the **reductive** **amination** is performed in the presence of cyanoborohydride anions.

CLMS(4)

4. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is diphtheria **toxin** or **toxoid**.

CLMS(5)

5. The **immunogenic** conjugate of claim 1, wherein the **toxoid** is CRM.sub.197.

CLMS(6)

6. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(7)

7. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a pseudomonas **toxin** or **toxoid**.

CLMS(8)

8. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a staphylococcus **toxin** or **toxoid**.

CLMS(9)

9. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a streptococcus **toxin** or **toxoid**.

CLMS(10)

10. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is pertussis **toxin** or **toxoid**.

CLMS(11)

11. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is an Escherichia coli **toxin** or **toxoid**.

CLMS(12)

12. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Haemophilus influenzae type b.

CLMS(13)

13. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 3.

CLMS(14)

14. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(15)

15. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 12.

CLMS(16)

16. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(17)

17. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(18)

18. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(19)

19. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 51.

CLMS(20)

20. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Haemophilis influenzae type b.

CLMS(21)

21. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(22)

22. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(23)

23. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(24)

24. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(25)

25. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by oxidative cleavage.

CLMS(26)

26. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by periodate.

CLMS(27)

27. An **immunogenic** conjugate comprising: a formalin treated **reductive** **amination** product of a **capsular** **polymer** fragment having a chain length of from about 10 to about 30 monomeric units and at least two carbonyl groups, which fragment is derived from the **capsular** **polymer** of a Streptococcus pneumonia or Haemophilus influenzae bacterium, and a **bacterial** **toxin** or **toxoid**, said conjugate comprising a crosslinked conjugate.

CLMS(28)

28. The **immunogenic** conjugate of claim 27, wherein the **bacterial** **toxoid** is diphtheria **toxoid**.

CLMS(29)

29. The **immunogenic** conjugate of claim 27, wherein the **toxoid** is CRM.sub.197.

CLMS(30) 30. The **immunogenic** conjugate of claim 27, wherein the **bacterial** **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(31)

31. The **immunogenic** conjugate of claim 1, in which the fragment is produced from **capsular** **polymer** of Streptococcus pneumoniae by first treating said polymer with acid, base or enzyme and then generating aldehyde groups by treatment with an oxidizing agent.

CLMS(32)

32. The **immunogenic** conjugate of claim 1, in which the fragment is produced from **capsular** **polymer** of Haemophilus influenzae by first treating said polymer with acid, base or enzyme and then generating aldehyde groups by treatment with an oxidizing agent.

US PAT NO: 4,808,700 L6: 3 of 6

CLAIMS:

CLMS(1)

We claim:

1. A conjugate of a PRP polysaccharide fragment, having reducing terminal groups derived from the capsular polysaccharide of Haemophilus influenzae type b by selective acidic hydrolysis of a portion of the ribosyl ribitol linkages therein, and a **bacterial** binding subunit, which binding subunit is a non-toxic polypeptide, having one or more immunoreactive and **antigenic** determinants of an LT-B subunit of the heat-labile enterotoxin of Escherichia coli (LT-BNT).

CLMS(2)

2. The conjugate of claim 1, wherein the nontoxic polypeptide is produced by an Escherichia coli bacterium that has been deposited with the NRRL and assigned accession No. B-15757, or by a mutant, recombinant, or genetically engineered equivalent derivative thereof.

CLMS(3)

3. The conjugate of claim 1, prepared by the **reductive** **amination** of the PRP fragment and protein.

CLMS(4)

4. The conjugate of claim 1, prepared by **reductive** **amination** in the presence of cyanoborohydride anions.

CLMS(5)

5. The conjugate of claim 1, wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of .ltoreq.1.08.

CLMS(6)

6. The conjugate of claim 1, wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.09-1.38.

CLMS(7)

7. The conjugate of claim 1 wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.39-1.99.

CLMS(8)

8. The conjugate of claim 1, wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 2.0-2.4.

CLMS(9)

9. A vaccine that elicits effective levels of anti-PRP antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 5 and a pharmaceutically acceptable carrier.

CLMS(10)

10. A vaccine that elicits effective levels of anti-PRP antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 6 and a pharmaceutically acceptable carrier.

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CLAIMS:

CLMS(1)

We claim:

1. A method for actively immunizing human infants against a **bacterial** pathogen having a **capsular** **polymer**, comprising:
(a) administering to a human infant an effective amount of an **immunogenic**-conjugate vaccine comprising a **capsular** **polymer** or fragment thereof, which is **immunogenic** in mature humans but less so in young humans, derived from a **bacterial** pathogen selected from the group consisting of Haemophilus influenzae type b, Escherichia coli, Pseudomonas aeruginosa, Neisseria menigitidis and Streptococcus pneumoniae, covalently attached to a **bacterial** outer membrane protein or to a **bacterial** **toxin**, **toxoid** or binding subunit thereof; and
(b) subsequently administering to said human infant an effective amount of the corresponding intact unconjugated **capsular** **polymer**.

CLMS(2)

2. The method of claim 1, wherein the immumogenic-conjugate vaccine comprises a **capsular** **polymer** which is **immunogenic** in adult humans but not in young humans, derived from the said **bacterial** pathogen covalently attached to a **bacterial** outer membrane protein or to a **bacterial** **toxin**, **toxoid** or binding subunit therefrom.

CLMS(3)

3. The method of claim 1, wherein the **immunogenic**-conjugate vaccine comprises a **capsular** **polymer** fragment which is **immunogenic** in adult humans but not in young humans, derived from the said **bacterial** pathogen covalently attached to a **bacterial** outer membrane protein or to a **bacterial** **toxin**, **toxoid** or binding subunit therefrom.

CLMS(4)

4. A method for actively immunizing human infants against a **bacterial** pathogen having a **capsular** **polymer** comprising:
(a) administering to a human infant an effective amount of an **immunogenic**-conjugate vaccine, comprising the **reductive** **amination** product of a **capsular** **polymer** or fragment thereof, which is **immunogenic** in mature humans but less so in young humans, having a reducing end and derived from the **capsular** **polymer** of a **bacterial** pathogen selected from the group consisting of Haemophilus influenzae type b, Escherichia coli, Pseudomonas aerguginosa, Neisseria menigitidis and Streptococcus pneumoniae, and a **bacterial** outer membrane protein or a **bacterial** **toxin**, **toxoid** or binding subunit therefrom, and
(b) subsequently administering to said human infant an effective amount of the corresponding intact unconjugated **capsular** **polymer**.

CLMS(5)

5. The method of claim 4, wherein the **immunogenic**-conjugate vaccine comprises the **reductive** **amination** product of an **immunogenic** **capsular** **polymer** having a reducing end and derived from the **capsular** **polymer** of the said **bacterial** pathogen and a **bacterial** outer membrane protein or a **bacterial** **toxin**, **toxoid** or binding subunit therefrom.

CLMS(6)

6. The method of claim 4, wherein the **immunogenic**-conjugate vaccine comprises the **reductive** **amination** product of an **immunogenic** **capsular** **polymer** fragment having, a reducing end and derived from the **capsular** **polymer** of the said **bacterial** pathogen and a **bacterial** outer membrane protein or a **bacterial** **toxin**, **toxoid** or binding subunit therefrom.

CLMS(7)

7. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Haemophilus influenzae type b.

CLMS(8)

8. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Escherichia coli.

CLMS(9)

9. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Neisseria meningitidis serogroup A.

CLMS(10)

10. The method of claim 1 or 4, wherein the unconjugated **capsular** **polymer** is from Neisseria meningitidis serogroup A.

CLMS(11)

11. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Neisseria meningitidis serogroup C.

CLMS(12)

12. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumcniae.

CLMS(13)

13. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 3.

CLMS(14)

14. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 6.

CLMS(15)

15. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 12.

CLMS(16)

16. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 14.

CLMS(17)

17. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 19.

CLMS(18)

18. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 23.

CLMS(19)

19. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Streptococcus pneumoniae serotype 51.

CLMS(20)

20. The method of claim 1 or 4, wherein the **capsular** **polymer** is from Pseudomonas aeruginosa.

CLMS(21)

21. The method of claim 1 or 4, wherein the **toxin**, **toxoid** or binding subunit therefrom is from a diphtheria bacterium.

CLMS(22)

22. The method of claim 1 or 4, wherein the **toxoid** is diphtheria CRM.

CLMS(23)

23. The method of claim 1 or 4, wherein the **toxoid** is diphtheria CRM.sub.197.

CLMS(24)

24. The method of claim 1 or 4, wherein the **toxin**, **toxoid** or binding subunit therefrom is from a tetanus bacterium.

CLMS(25)

25. The method of claim 1 or 4, wherein the **toxin** or **toxoid** is from a pseudomonas bacterium.

CLMS(26)

26. The method of claim 1 or 4, wherein the **toxin** or **toxoid** is

from a staphylococcus bacterium.

CLMS(27)

27. The method of claim 1 or 4, wherein the **toxin** or **toxoid** is from a streptococcus bacterium.

CLMS(28)

28. The method of claim 1 or 4, wherein the **toxin** or **toxoid** is from a pertussis bacterium.

CLMS(29)

29. The method of claim 1 or 4 wherein the outer membrane protein is from Haemophilus influenzae type b.

CLMS(30)

30. The method of claim 1 or 4 wherein the outer membrane protein is from Neisseria meningitidis.

CLMS(31)

31. The method of claim 1 or 4 wherein the outer membrane protein is from Streptococcus pneumoniae.

CLMS(32)

32. The method of claim 1 or 4 wherein the outer membrane protein is from E. coli.

CLMS(33)

33. The method of claim 1 or 4 wherein the outer membrane protein is from a pertussis bacterium.

US PAT NO: 4,761,283 L6: 5 of 6

CLAIMS:

CLMS(1)

I claim:

1. An **immunogenic** conjugate, comprising: the **reductive** **amination** product of a **capsular** **polymer** fragment having a reducing end and derived from the **capsular** **polymer** of a **bacterial** pathogen selected from the group consisting of Haemophilus influenzae type b, Escherichia coli, Neisseria meningitidis and Streptococcus pneumoniae, and the diptheria **toxin** protein CRM.sub.197.

CLMS(2)

2. The **immunogenic** conjugate of claim 1, wherein the **capsular** **polymer** is **immunogenic** in mature humans and less **immunogenic** in infant humans.

CLMS(3)

3. The **immunogenic** conjugate of claim 1, wherein the **reductive** **amination** is performed in the presence of cyanoborohydride anions.

CLMS(4)

4. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Haemophilus influenzae type b.

CLMS(5)

5. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Escherichia coli.

CLMS(6)

6. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis.

CLMS(7)

7. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis serogroup A.

CLMS(8)

8. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Neisseria meningitidis serogroup C.

CLMS(9)

9. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae.

CLMS(10)

10. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 3.

CLMS(11)

11. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(12)

12. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 12.

CLMS(13)

13. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(14)

14. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(15)

15. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(16)

16. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 51.

CLMS(17)

17. The **immunogenic** conjugate of claim 1, wherein the fragment is

derived from the **capsular** **polymer** by oxidative cleavage.

CLMS(18)

18. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by periodate.

CLMS(19)

19. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by hydrolysis of a glycosidic linkage.

CLMS(20)

20. The **immunogenic** conjugate of claim 19, wherein the hydrolysis is accomplished enzymatically.

CLMS(21)

21. The **immunogenic** conjugate of claim 19, wherein the hydrolysis is accomplished chemically.

CLMS(22)

22. The **immunogenic** conjugate of claim 19, wherein the hydrolysis is accomplished by acid.

CLMS(23)

23. The **immunogenic** conjugate of claim 4, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of .ltoreq.1.08.

CLMS(24)

24. The **immunogenic** conjugate of claim 4, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.09-1.38.

CLMS(25)

25. The **immunogenic** conjugate of claim 4, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.39-1.99.

CLMS(26)

26. The **immunogenic** conjugate of claim 14 wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of 2.0-2.4.

CLMS(27)

27. An **immunogenic** conjugate, comprising: a formalin treated **reductive** **amination** product of a **capsular** **polymer** fragment having a reducing end and derived from the **capsular** **polymer** of a **bacterial** pathogen selected from the group consisting of Haemophilus influenzae type b, Escherichia coli, Neisseria meningitidis and Streptococcus pneumoniae, and the diptheria **toxin** protein CRM.sub.197.

CLMS(28)

28. A vaccine that elicits effective levels of anti-**capsular** **polymer** antibodies in humans, comprising: the **immunogenic** conjugate of claim 1.

CLMS(29)

29. A method for actively immunizing humans **bacterial** pathogen having a **capsular** **polymer**, comprising: administering an effective amount of the vaccine of claim 28.

CLMS(30)

30. An **immunogenic** conjugate of (1) a **bacterial** **capsular** **polymer** fragment having a reducing end, said fragment produced by selective acid hydrolysis of a **capsular** **polymer** obtained from a **bacterial** pathogen selected from the group consisting of selected from the group consisting of Haemophilus influenzae type b, Escherichia coli, Neisseria meningitidis and Streptococcus pneumoniae, without significant destruction of **antigenic** specificity, and (2) the diphtheria **toxin** protein CRM.sub.197.

CLMS(31)

31. The **immunogenic** conjugate of claim 30, wherein the **capsular** **polymer** is derived from Streptococcus pneumoniae serotype 6 or 12.

CLMS(32)

32. A vaccine that elicits effective levels of anti-polyribosyl ribitol phosphate antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 1 and a pharmaceutically acceptable carrier.

CLMS(33)

33. A vaccine that elicits effective levels of anti-polyribosyl ribitol phosphate antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 4 and a pharmaceutically acceptable carrier.

CLMS(34)

34. A method for inducing active immunization against systemic infection in young warm-blooded mammals caused by the pathogen Haemophilus influenzae type b comprising administering an **immunogenic** amount of the conjugate of claim 4.

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CLAIMS:

CLMS(1)

I claim:

1. **immunogenic** conjugate comprising the reductve amination product of an **immunogenic** **capsular** **polymer** fragment having a chain length of from about 10 to about 30 monomeric units and a reducing end, which fragment is derived from the **capsular** **polymer** of a Streptococcus pneumoniae or Haemophilus influenzae bacterium, and a **bacterial** **toxin** or **toxoid**.

CLMS(2)

2. The **immunogenic** conjugate of claim 1, wherein the **capsular** **polymer** is **immunogenic** in mature humans and less **immunogenic** in infant humans.

CLMS(3)

3. The **immunogenic** conjugate of claim 1, wherein the **reductive** **amination** is performed in the persence of cyanoborohydride anions.

CLMS(4)

4. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is diphtheria **toxin** or **toxoid**.

CLMS(5)

5. The **immunogenic** conjugate of claim 4, wherein the **toxoid** is CRM.sub.197.

CLMS(6)

6. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(7)

7. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a pseudomonas **toxin** or **toxoid**.

CLMS(8)

8. The **immunogenic** conjugate of claim 1, wherein the **toxin** or toxiod is a staphylococcus **toxin** or **toxoid**.

CLMS(9)

9. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is a streptococcus **toxin** or **toxoid**.

CLMS(10)

10. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is pertussis **toxin** or **toxoid**.

CLMS(11)

11. The **immunogenic** conjugate of claim 1, wherein the **toxin** or **toxoid** is Escherichia coli **toxin** or **toxoid**.

CLMS(12)

12. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Haemophilus influenzae type b.

CLMS(13)

13. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 3.

CLMS(14)

14. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(15)

15. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 12.

CLMS(16)

16. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(17)

17. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(18)

18. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(19)

19. The **immunogenic** conjugate of claim 1, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 51.

CLMS(20)

20. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Haemophilis influenzae type b.

CLMS(21)

21. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 6.

CLMS(22)

22. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 14.

CLMS(23)

23. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 19.

CLMS(24)

24. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 23.

CLMS(25)

25. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by oxidative cleavage.

CLMS(26)

26. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by periodate.

CLMS(27)

27. The **immunogenic** conjugate of claim 1, wherein the fragment is derived from the **capsular** **polymer** by hydrolysis of a glycosidic linkage.

CLMS(28)

28. The **immunogenic** conjugate of claim 27, wherein the hydrolysis is accomplished enzymatically.

CLMS(29)

29. The **immunogenic** conjugate of claim 27, wherein the hydrolysis is accomplished chemically.

CLMS(30)

30. The **immunogenic** conjugate of claim 27, wherein the hydrolysis is accomplished by acid.

CLMS(31)

31. The **immunogenic** conjugate of claim 12, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of .ltoreq.1.08.

CLMS(32)

32. The **immunogenic** conjugate of claim 12, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.09-1.38.

CLMS(33)

33. The **immunogenic** conjugate of claim 12, wherein the fragment elutes on a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.39-1.99.

CLMS(34)

34. An **immunogenic** conjugate comprising a formalin treated **reductive** **amination** product of an **immunogenic** **capsular** **polymer** fragment having a chain length of from about 10 to about 30 monomeric units and a reducing end, which fragment is derived from the **capsular** **polymer** of a Streptococcus pneumoniae or Haemophilus influenzae bacterium, and a **bacterial** **toxin** or **toxoid**.

CLMS(35)

35. The **immunogenic** conjugate of claim 34, wherein the **bacterial** **toxoid** is diptheria **toxoid**.

CLMS(36)

36. The **immunogenic** conjugate of claim 35, wherein the **Toxoid** is CRM.sub.197.

CLMS(37)

37. The **immunogenic** conjugate of claim 34, wherein the **bacterial** **toxin** or **toxoid** is tetanus **toxin** or **toxoid**.

CLMS(38)

38. An **immunogenic** conjugate of (1) a PRP polysaccharide fragment having reducing terminal groups derived from the capsular polysaccharide of Haemophilus influenzae type b by selective acidic hydrolysis of a portion of the ribosyl ribitol linkages therein and (2) the diphtheria **toxin** protein CRM.sub.197.

CLMS(39)

39. The conjugate of claim 38 prepared by the **reductive** **amination** of the PRP fragment and protein.

CLMS(40)

40. The conjugate of claim 38 prepared by **reductive** **amination** in the presence of cyanoborohydride anions.

CLMS(41)

41. The conjugate of claim 38 wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of .ltoreq.1.08.

CLMS(42)

42. The conjugate of claim 38 wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.09-1.38.

CLMS(43)

43. The conjugate of claim 38 wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 1.39-1.99.

CLMS(44)

44. The conjugate of claim 38 wherein said PRP fragment elutes from a column of Bio-Gel P-10 at a Ve/Vo ratio of 2.0-2.4.

CLMS(45)

45. A vaccine that elicits effective levels of anti-**capsular** **polymer** antibodies in humans, comprising: the **immunogenic** conjugate of claim 1.

CLMS(46)

46. A method for actively immunizing humans against a **bacterial** pathogen having a **capsular** **polymer**, comprising: administering an effective amount of the vaccine of claim 45.

CLMS(47)

47. A vaccine that elicits effective levels of anti-PRP antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 41 and a pharmaceutically acceptable carrier.

CLMS(48)

48. A vaccine that elicits effective levels anti-PRP antibody formations in young warm-blooded mammals comprising an **immunogenic** amount of the conjugate of claim 42 and a pharmaceutically acceptable carrier.

CLMS(49)

49. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptoccoccus pneumoniae serotype 3.

CLMS(50)

50. The **immunogenic** conjugate of claim 5, wherein the **bacterial** pathogen is Streptococcus pneumoniae serotype 51.

=>

file CA 8197
file CA
819305

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d his

     (FILE 'CA' ENTERED AT 14:30:26 ON 30 SEP 92)
                DEL HIS
L1             11 S CAPSULAR POLYMER#
L2           1767 S REDUCTIVE AMINATION#
L3           1201 S BACTERIAL (10A) (TOXIN# OR TOXOID#)
L4              0 S L1 AND L2 AND L3
L5         140618 S LINK? OR CROSSLINK? OR CONJUGAT?
L6              3 S L1 AND L3 AND L5
L7          23214 S POLYSACCHARIDE#
L8              0 S L1 AND L2
L9             80 S REDUCTIVE DEAMINATION#
L10             0 S L1 AND L2 AND L3
L11             2 S L7 AND L9
L12             0 S L1 AND L9 AND L3

=>
```

```
   capsular polymer#
         1159 CAPSULA
       447413 POLYMER#
L1        11 CAPSULAR POLYMER#
               (CAPSULAR(W)POLYMER#)

=> s reductiee amination#
        19126 REDUCTIVE
        14957 AMINATION#
L2       1767 REDUCTIVE AMINATION#
               (REDUCTIVE(W)AMINATION#)

=> s bacterial (@@a) %toxim## or toxoid#)
        50397 BACTERIAL
        32371 TOXIN#
         1178 TOXOID#
L3       1281 BACTERIAL (10A) (TOXIN# OR TOXOID#)

=> s l1 and l2 and l3
L4          0 L1 AND L2 AND L3

=> s link? or crosslink? or conjugat?
        26923 LINK?
        81393 CROSSLINK?
        37082 CONJUGAT?
L5     140618 LINK? OR CROSSLINK? OR CONJUGAT?

=> s l1 and l3 and l5
L6          3 L1 AND L3 AND L5

=> d 1-3

L6   ANSWER 1 OF 3  COPYRIGHT 1992 ACS
AN   CA110(14):121374y
TI   Bacterial polymer capsule-bacterial toxin conjugate vaccines for
     infant immunization
AU   Anderson, Porter W.
CS   University of Rochester
LO   USA
SO   U.S., 14 pp. Cont.-in-part of U.S. 4,673,574.
PI   US 4762713  A  9 Aug 1988
AI   US 85-732200  8 May 1985
PRAI US 81-298102  31 Aug 1981
     US 83-511048  5 Jul 1983
IC   H61K039-02; H61K039-095
NCL  424092000
SC   63-3 (Pharmaceuticals)
SX   15
DT   P
CO   USXXAM
PY   1988
LA   Eng

L6   ANSWER 2 OF 3  COPYRIGHT 1992 ACS
AN   CA107(18):161671n
TI   Immunogenic conjugates for vaccines against childhood diseases.
AU   Anderson, Porter W.
LO   USA
SO   U.S., 11 pp. Cont.-in-part of U.S. Ser. No. 298,102, abandoned.
PI   US 4673574  A  16 Jun 1987
AI   US 83-511048  5 Jul 1983
PRAI US 81-298102  31 Aug 1981
IC   ICM  A61K039-02
     ICS  A61K039-09; A61K039-102; C07K015-04
NCL  424092000
```

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SC    63-3 (Pharmaceuticals)
SX    15
DT    P
CO    USXXAM
PY    1987
LA    Eng

L6    ANSWER 3 OF 3  COPYRIGHT 1992 ACS
AN    CA105(18):150789k
TI    Immunogenic conjugates of E. coli LT-B enterotoxin subunit and
      capsular polymers
AU    Anderson, Porter W.; Clements, John D.
CS    Praxis Biologics, Inc.
LO    USA
SO    Eur. Pat. Appl., 122 pp.
PI    EP 172107  A1  19 Feb 1986
DS    R:  AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE
AI    EP 85-401604  6 Aug 1985
PRAI  US 84-639293  10 Aug 1984
IC    ICM  A61K039-02
      ICS  A61K039-102; A61K039-108; A61K039-095; A61K039-09; A61K039-104;
           C07K015-00; C12P021-00; C12N015-00; A61K039-385; A61K039-395
ICI   C12R001-19, C12R001-38, C12R001-21, C12R001-36, C12R001-46,
      C12R001-63
SC    63-3 (Pharmaceuticals)
SX    1, 15
DT    P
CO    EPXXDW
PY    1986
LA    Eng

=> s polysaccharide#
L7        23214 POLYSACCHARIDE#

=> s l1 and l2
L8            0 L1 AND L2

=> s reductive deamination#
          19126 REDUCTIVE
           3270 DEAMINATION#
L9           80 REDUCTIVE DEAMINATION#
                (REDUCTIVE(W)DEAMINATION#)

=> s l1 and l2 and l3
L10           0 L1 AND L2 AND L3

=> s l7 and l9
L11           2 L7 AND L9

=> d 1-2

L11   ANSWER 1 OF 2  COPYRIGHT 1992 ACS
AN    CA93(17):163628v
TI    Some new methods for structural elucidation and modification of
      complex carbohydrates
AU    Loenngren, Joergen
CS    Dep. Org. Chem., Univ. Stockholm
LO    Stockholm S-106 91, Swed.
SO    Int. Congr. Pure Appl. Chem., [Proc.], 27th, 205-11
SC    9-0 (Biochemical Methods)
DT    J
CO    PCPAAI
IS    0369-8661
PY    1980
LA    Eng
```

L12 ANSWER 2 OF 2 COPYRIGHT 1992 ACS
AN CA93(15):150539s
TI Reductive deamination of aminodeoxy groups in glycosides and polysaccharides
AU Arnarp, Jan; Garegg, Per J.; Lengstad, Bengt; Loenngren, Joergen
CS Dep. Org. Chem., Univ. Stockholm
LO Stockholm S-106 91, Swed.
SO Carbohydr. Res., 83(2), 394-7
SC 33-5 (Carbohydrates)
DT J
CO CRBRAT
IS 0008-6215
PY 1980
LA Eng

=> s l1 and l9 and l3
L12 0 L1 AND L9 AND L3

=>

] d ab 1-2 l11

L11 ANSWER 1 OF 2 COPYRIGHT 1992 ACS
AB A review with 19 refs. The detn. of abs. configuration of monosaccharides using gas chromatog; the detn. of abs. configuraton of pyruvic acid acetals present in polysaccharides; the deamination of aminodeoxy sugars; and the structural elucidation of the capsular polysaccharides of Streptococcus pneumoniae type 1 were discussed.

L11 ANSWER 2 OF 2 COPYRIGHT 1992 ACS
AB The title deamination was carried out with H2NOSO3H. Deoxyglycosides were obtained in 19-52% yield, e.g., Me 2-amino-2-deoxy-.beta.-D-glucopyranoside hydrochloride gave 52% Me 2-deoxy-.beta.-D-arabino-hexopyranoside. Streptococcus pneumoniae Type 14 capsular polysaccharide and Vibrio cholerae O-antigen were first N-deacylated and then deaminated to give 55 and 60% resp. partly deaminated polysaccharide.

=>